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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,795	01/08/2004	Charles S. Taylor	3135.001	8595

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EXAMINER

DANIELS, MATTHEW J

ART UNIT PAPER NUMBER

1732

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/754,795	TAYLOR ET AL.	
	Examiner	Art Unit	
	Matthew J. Daniels	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 29-54 is/are rejected.
- 7) ☒ Claim(s) 23-28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/26/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In the reply received 13 January 2006, Claims 55-70 were cancelled.
2. Applicant is advised that the *Ex parte Quayle* action closing prosecution mailed on 6 December 2005 is vacated. Prosecution on the merits of this application is reopened on claims 1-54 considered unpatentable for the reasons indicated below.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claim 5, 12 and 53** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims invoke 35 USC 112, sixth paragraph because they meet the three-prong analysis set forth in MPEP 2181(I) by use of the phrase "means for moving". However, in reviewing the specification, no moving means has been set forth. Therefore, the claims which contain this limitation are indefinite. This rejection may be overcome by distinctly pointing out the portion of the specification which discloses the moving means or amending the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lemelson (USPN 3861955). **As to Claim 32**, Lemelson teaches a high volume print forming machine, comprising in combination:

- a) a bed having a plurality of alignment locations (Figs. 1-3);
- b) at least two of said alignment locations positioned at different relative heights to each other (Item 27 in Fig. 3);
- c) at least two alignment locations spaced laterally from a third alignment location in two non-parallel directions from each other, such that the alignment locations are not arrayed linearly (Fig. 5); and
- d) a printer located above the bed and adapted to print material down toward the bed (Fig. 2, Item 24).

Lemelson appears to be silent to at least three of the alignment locations positioned at different relative heights to each other. However, in one interpretation, the corners of the printed edges of each printed area (27' in Fig. 5) could each be considered to be alignment locations, and thus the embodiment shown in Fig. 3 would have at least three different alignment locations at three or more different heights (Item 27 in Fig. 3). In a second interpretation, the placement of

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the printed alignment locations is clearly a design choice, and multiple different heights would have been prima facie obvious

5. **Claims 1-5, 13-15, 20, 21, 29-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766). **As to Claim 1**, Taylor teaches a system for high volume print-forming comprising in combination:

- a) a bed having a plurality of alignment locations (Figs. 1-2F and 6:15-44);
- c) a plurality of substrate blocks, each including a substantially planar exposed surface and adapted to be positioned on one of the alignment locations of a bed and to move between alignment locations while supporting upon the exposed surface a structure being print formed (Fig. 1, Item 24, Fig. 2, Item 25, and 6:15-44);
- d) a printer located adjacent the exposed surface of the substrate blocks and adapted to print material down toward the substrate blocks and upon the structures being print formed on those blocks (Figs. 1-2F).

Taylor appears to be silent to step b), namely at least two alignment locations positioned at different heights relative to each other. However, Schmitt teaches this aspect (Fig. 1). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatus of Schmitt into that of Taylor because doing so would provide the ability to simultaneously form a large number of stacks and achieve high output without operating at high cycle speeds (2:11-33) into Taylor's method. **As to Claims 2-5**, Schmitt teaches at least two alignment locations spaced laterally and non-parallel directions such that they are no linear (multiple bricks are provided in each row, and multiple columns are

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provided in Fig. 1), a sloping bed surface, planar steps, and means for moving between steps (Fig. 1). **As to Claims 13 and 14**, Schmitt teaches spacing with the steps being progressively lower, and following a downward sloping linear path (Fig. 1), and at least two rows of the steps within a common column perpendicular to the rows being of similar height (Fig. 1). **As to Claim 15**, Schmitt teaches a plurality of substrate block holders each adapted to hold one of the substrate blocks precisely upon an alignment location (See the grips, 19, in Fig. 1 and also Item 112 in Fig. 8). **As to Claim 20**, Schmitt teaches clamps to mechanically hold the substrate blocks precisely (Item 19 in Fig. 1). **As to Claim 21**, Taylor teaches a printer including a plurality of print spaces overlying alignment locations of a bed, the spaces adapted to print material in patterns corresponding with a geometry of different layers of a common structure to be formed (5:1-6:63). **As to Claims 29 and 30**, Schmitt teaches starter blocks each having a common height (Fig. 8). **As to Claim 31**, the ordinary artisan using the combined apparatus would have found it obvious to provide starting blocks with varied height to avoid dropping material onto the conveyor.

6. **Claims 6-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), and further in view of Roberts (USPN 5540545) and Pearne (USPN 3656634). Taylor and Schmitt teach the subject matter of Claim 5 above under 35 USC 103(a). It should be noted that Claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Apparatus claims cover what a device is, not what a device does. **As to Claims 6-12**, Taylor and Schmitt appear to be silent to the claimed shuffler, lifter, mover, curb, and spiral. However, these elements are

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conventional in the art of conveyors and are taught by Roberts and Pearne. For example, Roberts teaches a shuffler (Fig. 1 and Figs. 16-17), lifter (Fig. 1), mover (Item 30 in Fig. 1), curb (Item 30 in Fig. 1), and spiral (Item 24 in Fig. 1). Pearne additionally teaches a shuffler (Fig. 1), a lifter (Fig. 1, Item 46), mover (Fig. 1), and a curb (Figs. 2a and 2b). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatuses of Roberts and Pearne into that of Taylor and Schmitt in order to provide the ability to stack and align parts in an optimum configuration.

7. **Claims 16-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), and further in view of Jaffa (USPN 3763776). Taylor and Schmitt teach the subject matter of Claim 15 above under 35 USC 103(a). **As to Claims 16-18**, Taylor teaches alignment holes (Item 112 in Fig. 8) and alignment devices which can be considered to be pins (the corresponding rollers in Fig. 8) of complementary form which are received within the holes when properly aligned. However, Taylor and Schmitt are silent to the vacuum. However, Jaffa additionally teaches a screen printing machine having both vacuum pallets and registration means (1:60-58). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatus of Jaffa into that of Taylor and Schmitt in order to provide complete registration and firm fixing of the article with the printing head during the printing process.

8. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), and further in view of Beale (USPN 5157438).

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Taylor and Schmitt teach the subject matter of Claim 15 above under 35 USC 103(a). **As to Claim 19**, Taylor and Schmitt appear to be silent to magnetic holding devices. However, magnetic holding devices for holding blocks in a precise position are conventional in the art. For example, Beale teaches magnetic clamping means for holding against axial movement (1:48-2:7). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatus of Beale into that of Taylor and Schmitt in order to avoid movement during a screen printing operation (2:13-15).

9. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), and further in view of Hubbard (USPN 4466994). Taylor and Schmitt teach the subject matter of Claim 21 above under 35 USC 103(a). **As to Claim 22**, Taylor and Schmitt are silent to a screen printer with a screen containing spaces. However, Hubbard teaches a screen printer containing spaces (Abstract, Fig. 1). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatus of Hubbard into that of Taylor and Schmitt in order to provide the benefits of simultaneous coating of multiple articles.

10. **Claims 32, 33, 48, 49, 53** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766). **As to Claim 32**, Taylor teaches a system for high volume print-forming comprising in combination:

a) a bed having a plurality of alignment locations (Figs. 1-2F and 6:15-44);

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c) at least two of the alignment locations spaced laterally from a third alignment location in two non-parallel directions from each other such that the alignment locations are not arrayed linearly (Figs. 1 and 2A-2F);

d) a printer located adjacent the exposed surface of the substrate blocks and adapted to print material down toward the substrate blocks and upon the structures being print formed on those blocks (Figs. 1-2F).

Taylor appears to be silent to step b), namely at least three alignment locations positioned at different heights relative to each other. However, Schmitt teaches this aspect (Fig. 1). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatus of Schmitt into that of Taylor because doing so would provide the ability to simultaneously form a large number of stacks and achieve high output without operating at high cycle speeds (2:11-33) in Taylor's method. **As to Claim 33**, Taylor teaches a printer, a plurality of print spaces overlying the alignment locations, the spaces adapted to print material in patterns corresponding to a geometry of different layers of a common structure to be formed. **As to Claims 48 and 49**, Schmitt teaches a plurality of substrate blocks each being adapted to be positioned precisely on an alignment location of the bed and to move between alignment locations while supporting a structure thereon (Fig. 1). Taylor teaches the printer (see the rejection of Claim 32). **As to Claim 53**, Schmitt teaches a machine including means for moving the substrate blocks between alignment locations (Fig. 1)

11. **Claims 34-38** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), and further in view of Hubbard (USPN

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4466994). Taylor and Schmitt teach the subject matter of Claim 32 above under 35 USC 103(a).

As to Claims 34-37, Taylor and Schmitt are silent to the claimed screen printer. However, Hubbard teaches a screen printer, being sized larger than a bed, with a screen having spaces corresponding to alignment locations in the bed, with a pattern corresponding to a geometry (Fig. 1). Schmitt teaches a bed having different heights (Fig. 1). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatus of Hubbard into that of Taylor and Schmitt in order to provide the benefits of simultaneous coating of multiple articles. **As to Claim 38**, Schmitt teaches a height differential between steps that is uniform and equal.

12. **Claims 39-47** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), Hubbard (USPN 4466994) and further in view of Penn (USPN 5260009). Taylor, Schmitt, and Hubbard teach the subject matter of Claim 34 above under 35 USC 103(a). **As to Claims 39-45**, Taylor and Schmitt are silent to a screen printer, and therefore to the subject matter of Claims 39-45. Hubbard teaches a screen printer, and that multiple screens can be used for different colors (8:28-46). Hubbard is silent to an apparatus that can remove ink from the finished structure, and therefore to the debinder.

However, Penn teaches a debinder (3:34-36), including at least liquid washing. It should also be noted that Claims 42 and 44 are drawn to method limitations, and not to the apparatus. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the debinding apparatus of Penn into that of Taylor, Schmitt, and Hubbard in order to provide the ability to dissolve supporting layers to leave the three-dimensional object intact. **As**

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to **Claim 46**, Taylor teaches curing lamps (5:64), which perform the function of densifying. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to provide curing lamps after the debinder in order to ensure complete curing of the three-dimensional object. As to **Claim 47**, Penn teaches a liquid washing apparatus (3:34-36), which would have been prima facie obvious in the combined apparatus.

13. **Claims 50 and 51** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), and further in view of Jaffa (USPN 3763776). Taylor and Schmitt teach the subject matter of Claim 49 above under 35 USC 103(a). As to **Claims 50-51**, Taylor teaches alignment holes and alignment structures upon the substrate blocks which have a contour which is complementary to structures within the bed (Item 112 in Fig. 8 and rollers), but Taylor and Schmitt are silent to vacuum. However, Jaffa additionally teaches a screen printing machine having both vacuum pallets and registration means (1:60-58). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatus of Jaffa into that of Taylor and Schmitt in order to provide complete registration and firm fixing of the article with the printing head during the printing process.

14. **Claim 54** is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (USPN 5348693) in view of Schmitt (USPN 4068766), and further in view of Roberts (USPN 5540545) and Stevenson (USPN 4824306). Taylor and Schmitt teach the subject matter of Claim 53 above under 35 USC 103(a). As to Claim 54, Schmitt teaches multiple rows and columns arranged in a

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rectangular array of steps (see the bricks, Fig. 1), however, Taylor and Schmitt are silent to the shuffler blade and spatula. However, Roberts teaches a shuffler blade (Fig. 1, item 30) and Stevenson teaches a spatula (Fig. 4). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the apparatuses of Roberts and Stevenson into that of Taylor and Schmitt in order to provide the ability to stack and align parts in an optimum configuration.

Allowable Subject Matter

15. **Claim 23** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. **Claims 24-28** are also objected to as being dependent on Claim 23.

The following is a statement of reasons for indication of allowable subject matter: The prior art fails to teach or fairly suggest the apparatus limitations of Claim 1 in combination with a screen sized at least as large as the bed, the alignment locations on the bed including steps, wherein a number of the spaces contained within the screen is equal to a number of steps in the bed, wherein each space on the screen has a pattern corresponding with a geometry of a separate layer of the structure to be formed, wherein each step of the bed has a different height, and wherein a height differential between the steps of the bed is uniform and equal to a height of each layer of print material being printed by the printer.

Independent Claim 32 would also be allowable if amended to incorporate the limitations of Claims 21-23.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 7:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJD 3/29/06

MJD



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